

What is claimed is:

1. A method of producing a perovskite complex oxide wherein,  
at the time of producing a perovskite ( $\text{RTO}_3$ ) complex oxide phase  
5 by heat treating a precursor substance that is a powdery starting material  
containing at least one rare earth element R and at least one transition metal  
element T, there is used as the precursor substance an amorphous substance  
containing the R and T components at a content ratio required for producing the  
complex oxide.
- 10 2. A method of producing a perovskite complex oxide according  
to claim 1, wherein a perovskite complex oxide phase is generated by  
heat-treating the precursor substance at a temperature of 400 °C – 700 °C.
- 15 3. A method of producing a perovskite complex oxide according  
to claim 1, wherein the amorphous substance is a precipitated substance  
obtained by precipitation from an aqueous solution containing R ions and T ions  
using a precipitant.
- 20 4. A method of producing a perovskite complex oxide according  
to claim 1, wherein the amorphous substance is a precipitated substance  
obtained by precipitation from an aqueous solution containing R ions and T ions  
using a precipitant and a reducing agent.
- 25 5. A method of producing a perovskite complex oxide according  
to claim 3 or 4, wherein the precipitant is an alkaline carbonate or carbonate  
containing ammonium ions.
- 30 6. A method of producing a perovskite complex oxide according  
to claim 3 or 4, wherein the precipitant is a combination of ammonia and carbon  
dioxide.

7. A method of producing a perovskite complex oxide according to claim 4, 5 or 6 wherein the reducing agent is a hydrogen-generating compound.

5           8. A method of producing a perovskite complex oxide according any of claims 1 to 7, wherein the perovskite complex oxide has a BET specific surface area exceeding 10 m<sup>2</sup>/g.

9. A precursor substance of a perovskite complex oxide, which is a  
10 precursor substance to be subjected to heat treatment for producing a perovskite complex oxide phase composed of an amorphous substance containing R and T components at a content ratio required for producing the complex oxide, where R is at least one rare earth element and T is at least one transition metal element..

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10. A precursor substance according to claim 9, wherein part of R is replaced by an alkali earth metal.